IX. *Some Observations on an Insect that destroys the Wheat, supposed to be the Wireworm. By Thomas Walford, Esq. F.A.S. & L.S. With an additional Note, by Thomas Marsham, Esq. Treas. L.S.*

Read April 21, 1807.

The insect which is the subject of the following memoir has never, I believe, been noticed or described by any entomologist or agriculturist; its depredations are the annual topic of conversation with the latter, yet few know what insect it is that destroys the wheat in the months of October and November, under the denomination of the Wireworm. Many suppose it to be a *Scolopendra*, others a species of *Iulus*, and some the larva of a *Tipula*, or of the *Scarabæus Melolontha* of Linnæus. I supposed it to be one of the above, till I found two insects in the very act of destroying the wheat, as represented in the annexed figure (Tab. XVIII. fig. 3. *a*.). These I believe to be the insects commonly, although very improperly, called the Wireworms in Essex and Suffolk: they appear to me *larvæ* of one of the coleopterous tribe; but to what genus they belong can at present only be conjectured. The projecting jaws somewhat resemble those of a *Lucanus*. The two jointed bristles, and the cylindrical tail, give it an affinity to *Staphylinus*; but the *larva* of that insect is supposed to be carnivorous, and not graminivorous. I fear, therefore, that the genus of this insect cannot be determined till it be traced to its perfect state.

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I shall now proceed to relate the discovery of the insect, and to detail the injury supposed to be done by it.

In October 1802, having occasion to call upon an agriculturist* whose skill and judgement in farming are rarely equalled, he informed me that his green wheat was dying and losing plant very much, the reason of which he could not comprehend. I immediately suspected that it was occasioned by the Wireworm, but what kind of insect it was, I could not inform him. I therefore requested that he would accompany me to the field where the greatest injury was done, in order that we might examine into it. This we accordingly did; and we were successful in discovering three of the insects in question, of which two were in the act of destroying the wheat, as above mentioned. With their projecting jaws these insects cut round the outside grass about an inch below the surface of the soil, to get at the young white shoot in the centre, which they eat: upon this, vegetation is immediately stopped, and the plant dies. I suspect that they first eat the flour in the grains which has not been drawn up by vegetation; for, when we touched them, they ran into the husks; and two of the three insects I carried home in the husks, which appear to be their habitations, and probably the place where they change from the *larva* to their perfect state.

The injury which the public sustains by the ravages of these insects may, in some measure, be calculated from Mr. Olley's loss in 1802: he sowed fifty acres of a clay soil with wheat; out of these ten were destroyed by them, which were replanted by dibbling-in one bushel of seed per acre. The price of wheat at that time was eight shillings per bushel.

We here observe one fifth part of the quantity sown destroyed

* Mr. Thomas Olley, of Stoke next Clare, in Suffolk.

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by these noxious insects: but the depredations of the Wireworm, as I am informed by a friend* whose experience and observation enable him to calculate with superior judgement, being principally confined to wheat sown upon clover leys, old pastures recently broken up, pea and bean stubbles, &c., we may suppose the general average of the injury to amount to much less than a fifth (Mr. Olley's loss): a twentieth part of what is sown upon this description of lands will, I think, be deemed a very fair and moderate calculation. The number of cultivated acres of land in England at the time above mentioned was computed at seven millions, of which 2,400,000 were calculated to be sown with wheat; and as only one half of the wheat annually sown is supposed to be upon clover leys, old pastures, &c., our calculations must be confined to 1,200,000 acres instead of 2,400,000: this will give 60,000 acres as annually destroyed by the insect in question; which replanted, at one bushel per acre, will require 60,000 bushels of seed, which, at eight shillings per bushel, are worth 24,000*l.* Besides this, although no extra expense is incurred by the farmer in preparing the land, yet he has to pay for dibbling-in the seed, which, at five shillings and threepence per acre, will cost 15,750*l.*, or, at the full price, six shillings per acre, 18,000*l.* If the land requires harrowing, there will be a further charge of ninepence per acre, or 2,250*l.*, not to name other items, which render it difficult precisely to ascertain the loss of the farmer.

If the above calculation be thought a fair one, and I see no reason why it should not, we find the quantity of wheat lessened to the market by the depredations of these insects is very frequently, if not annually, sixty thousand bushels; which oc-

* Allen Taylor, Esq. Wimbish-hall, Essex.

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casions to the farmers an additional expense of at least 15,750*l.*

I hope these observations will prove a spur to gentlemen more conversant in entomology and agriculture than myself, to excite them to inquire into this subject, the result of which must ultimately be beneficial to the public at large, by discovering some means of preventing the injury done by these mischievous insects. At present we know of no other than early ploughing, which is not always convenient to the farmer, as he wants to feed his clover land as late as the season will admit of. Unslaked lime has been tried without success*; although it is well known, if laid thick upon the land and ploughed in immediately, it will destroy insects of every kind, that are in the soil; but in many places the expense of procuring lime is too great to think of using it in sufficient quantities to answer the intended purpose†.

As the drawing is from the accurate pencil of Mr. Sowerby, no description of the insect is necessary.

EXPLANATION OF THE FIGURES.

Tab. XVIII. *Fig.* 1. The insect, natural size.
2. The same, magnified.
3. *a.* The same, destroying the wheat.
— *b.* Hole in the husk, into which the insect ran upon being disturbed.

Additional

* Farmer's Magazine, page 450.

† I am aware of its being said that part of the injury sustained is done by the grub of

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